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The Relationship Between Canine Hysteria and Dog Biscuit

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My excuse for returning to this well-worn thesis is the fact that I have been able in some small degree to confirm by experiment certain views I expressed many years ago on the aetiology of this complaint.

I will not weary readers with details of the symptoms of canine hysteria. They are well known to all who practise with dogs. I do feel, however, that there is room for great improvement in the differential diagnosis of the canine hysterias. In reading through the literature one cannot but observe that writers often lump two or three different hysteric conditions together as though the cause must of necessity be a common one to all. The object of what is written here is to emphasise and help to prove that there is an infective, biscuit-borne hysteria of the dog. Articles have been written and research conducted to incriminate other articles of food commonly used for dogs. All I am concerned with at present is to draw attention to the fact that biscuit made from flour from certain sources can bring on attacks of hysteria in a large proportion of dogs that consume it, even after many months of issue from the manufacturer. Before I recount observations and experiments that bear out this contention, there are some general considerations that ought to be borne in mind.

It is not sufficiently recognised that the dog tribe, to use a horrid word, is extremely psychic. Clairvoyance and clairaudience are by no means confined to the human species. The dog possesses the peculiar power of rapidly passing from the reception of those wavelengths of sight and sound normally accepted by optic and aural nerves, to another set of wavelengths during the use of which the phenomena that are seen and heard are often of such a nature as to induce extreme terror. One has only to consider the clairvoyance induced by advanced alcoholic poisoning, with its concomitants of rats and serpents, to make this point clear.

So first of all the student of hysteria must come to recognise that our canine subjects are an easy soil for hysterigenic agents.

Next we must recognise that the process of breeding dogs for so-called "points," which implies close in-breeding, cessation of natural selection, with its unnatural rejection of fit progenitors, has increased to a great degree the borderline mental cases that are such easy subjects of hysterias of a purely endogenous character.

We who keep kennels know to our sorrow how contagious is the howl of the homesick dog. One new entrant of this type can convert a peaceful kennel into a place of noise and unrest by day and by night, for the chorus of sympathy is very hard to check. Then the cry of a patient in pain, an epileptic seizure, a death in the kennels, can all engender the pack howl, so that it is hard to know which inmate is responsible for the group manifestation. I am sure much of this mass hysteria that occurs from time to time in greyhound kennels is of this nature, and from the neurosis of one individual is set in motion the large-scale veterinary treatment of a number of dogs whose sole disease is mass sympathy with the hysterical complaint of one neurotic and maybe unrecognised culprit. Moreover, I am convinced that much time and research have been wasted over outbreaks of this nature, when a little attention to the natural history of the dog family would have shown that there was no ground for laboratory intervention.

Assuming that there is, as I believe, a specific, biscuit-borne hysteria of the dog, what postulates must we seek to allow us to think that an outbreak of hysteria under review is of this type? First, of course, that biscuit is being used. Secondly, that it has usually been a new consignment, often taken into use some three or four days before the attack of hysteria commences. In the case of solitary pets, as we meet them in most households, we may often have our suspicions confirmed by further cases in the district, the same dealer and brand of biscuit being involved. In 1932 I was able to trace 25 separate household outbreaks to one dealer and one bin. And the last two or three occurred with a different biscuit that had been put into the bin occupied by the hysterigenic biscuit and had presumably been contaminated thereby. When biscuit hysteria occurs in kennels it affects most of the animals consuming it. Finally, the feeding of hysterigenic biscuit to animals experimentally will induce the disease.

As to the causative agent of this hysteria, it has yet to be isolated. My observations have led to some peculiar findings, but as a whole they all point one way. I would group the disease with the allergic complaints such as the asthmas. The causal material resists heat, as witness its survival through biscuit manufacture, though after reading the history of the survival of the biscuit weevil in army biscuit* this is not so astonishing as it seems at first sight. It is not so resistant to cold, and I believe the most likely preventive that can be utilised by biscuit manufacturers when they learn that their biscuit is contaminated will be a freezing process to destroy the active agent.

I have not been able to infect dogs by exposing them to urine and faecal contact in kennels previously occupied by a known case, but I would not altogether rule out the possibility of this occurring, although I believe it would require day by day ingestion of infective excreta to accomplish this. The infection seems undoubtedly to be cumulative. That is to say, the biscuit has to be fed for at least three days and

* Shipley "The Minor Horrors of War," Chap. IV. (Smith Elder, 1915).

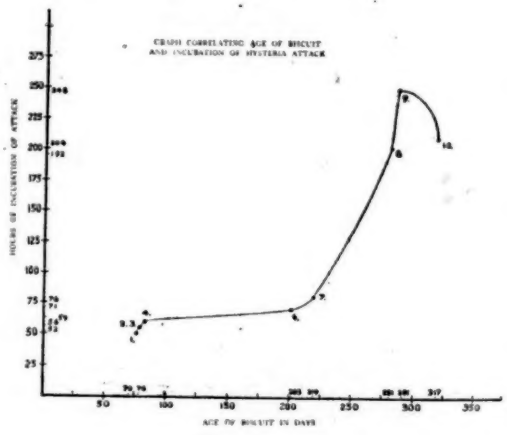
to constitute the bulk of the daily ration to bring on attacks. Small doses or intermittent use of the biscuit with a day or two's interval between administration leads to temporary immunity, which can be broken down a week or two later by more intensive administration. Another peculiar feature is that the older the biscuit the longer is the experimental incubation before hysteria develops. The addition of milk and/or a vitamin-mineral concentrate to the infective biscuit did not check the development of attacks.

My views as to why some biscuit is infective, although the bulk of biscuit is not so, are not without careful observation to back them. First, it is very difficult to get a manufacturer to own that his biscuit is pathogenic. When he admits as much then it is equally difficult to get from him the sources of his flour supply and their countries of origin. The one manufacturer who proved most helpful, even to the extent of sending me a liberal supply of biscuit returned to him as having caused hysteria, insisted on anonymity or his name would appear in this paragraph in grateful acknowledgment. Without wearying the reader, suffice it to say that flour from the Far East seems to be the usual source of the disease, and that it is not of a quality that would usually be used, except at times of rising prices when competing biscuit manufacturers must keep down their costs. So hysteria follows crises in world affairs that impinge upon grain supplies. My working hypothesis expressed in 1930* remains the same, that it is a pollen or seed contaminant of inferior quality grain.

My first contact with authentic biscuit hysteria (I think it is time a new word such as kunophobia was coined for this entity) was in 1926, when in consultation with the late Mr. Sewell, I dealt with an outbreak in an Airedale kennel. This has already been recorded, but from it I learned one or two facts that have since been confirmed by later observations. These were that biscuit holds the infective agent for a long time (in this instance six months) and that the incubation of later attacks in previous victims may be only a matter of hours from the commencement of feeding infected material.

It was not until the early days of the present war that I was able to obtain sufficient material to start feeding experiments on selected subjects under my personal observation. For, owing to lack of patients and boarders, I was able to isolate, and successfully too, a portion of my kennels for the purpose. It was not without some excitement that I found that my first subject fed on suspected biscuit went down with an attack at the 52nd hour. I was then brought to realise that further experiments of this type might come within the law governing experiments on living animals. Conversation with laboratory people possessing experimenters' licences did not lead me to think I should be able to obtain one. And I would like here to pay tribute to the quick help and sympathy of Dr. J. A. Giles, of the Home Office, which resulted in my obtaining the necessary licence to continue experiments.

At foot is a table showing the results of feeding biscuit previously known to have set up hysteria. The biscuit was supplied by a firm of well known manufacturers, with the history that it had been returned to them having been the source of a hysteria outbreak. It appeared to be a good average wholemeal terrier meal. It only failed to produce hysteria in two out of eleven instances, one an aged dog, which in my experience have for the most part immunity. In No. 11, the Kerry Blue, the supply of biscuit failed at this point so I do not know whether the age of the biscuit or of the subject, caused the


GRAPH CORRELATING AGE OF BISCUIT AND INCUBATION OF HYSTERIA ATTACK
HOURS OF INCUBATION OF ATTACK
AGE OF BISCUIT IN DAYS

* *The Veterinary Journal*, March, 1930.

Subject	*Material Fed*	*Biscuit Age from Manufacturer*	*Attack, Hours' Incubation*	*Remarks*
1. Black Labrador dog, 2 years ...	Biscuit alone ...	70 days	52 hours	
2. Golden Labrador dog, 2 years ...	" ...	70 "	56 "	
3. Golden Labrador bitch, 3 years ...	" ...	70 "	56 "	
4. Airedale bitch, 1 year	" ...	76 "	59 "	
5. Aged Sealyham	" ...	86 "	None	Fed for 7 days. High blood pressure.
6. Terrier, 1 year	" ...	203 "	71 hours	Fed again 14 days later. Attack at 74th hour.
7. Terrier, 3 years	" ...	219 "	76 "	
8. Sealyham, 1½ years	Biscuit and milk ...	281 "	192 "	
9. Mongrel terrier, 2 years	Biscuit and Admin	291 "	248 "	
10. Scottie, 2 years	Biscuit ...	317 "	204 "	C.f. 8 and 9.
11. Kerry Blue, 7 years	Biscuit ...	528 "	None	Age of dog? Age of biscuit?

BOVINE STERILITY:

The Use of Oestrogens for the Induction of Oestrus in Anoestrous Cattle

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Bhattacharya, Hammond and Day (1941) have recently described the use of the gonadotrophin of pregnant mares' serum for the treatment of cows and heifers which fail to come into season. In this connection we feel it desirable to draw attention to the paper by Steinach, Stäheli and Grüter (1934) reporting the successful use of oestradiol monobenzoate for the prompt induction of oestrus in anoestrous bovines. Steinach *et al.* established the following points: (*i*) oestrogen treatment not merely induced the symptoms of "heat," but also re-established regular oestrous cycles, and though conception rarely followed service at the artificially induced oestrus, the next service was usually fertile; (*ii*) the treatment was effective in cases of anoestrus due to a persistent corpus luteum.

Experiments which we are at present carrying out with the kind co-operation of members of the veterinary profession, have to date amply confirmed the findings of Steinach *et al.* In view of the importance of achieving maximum breeding efficiency in our dairy herds during the coming winter we feel that a brief mention of our results is not out of place, though the investigation is not yet complete. Our results indicate that in most cases a single intramuscular injection of 10 mg. oestradiol dipropionate or monobenzoate is sufficient to induce oestrus in anoestrous cows or heifers. We suspect that a lesser amount (perhaps 5 mg.) may suffice in many cases, and this possibility is under investigation. In most of our experimental animals the treatment with oestrogen has elicited a regular succession of oestrous cycles, and conception has usually resulted not from service at the artificially induced oestrous periods, but at a subsequent service.

Advantages of the use of oestrogen for the purpose under consideration over pregnant mares' serum are (*i*) it is considerably cheaper; (*ii*) it is effective whether or not the anoestrous condition is typified by the presence in the ovary of a corpus luteum, and in the former case therefore the necessity for removal of the corpus luteum by rectal manipulation (an operation which is sometimes impossible and even when feasible, attended with some risk of ovarian haemorrhage or other ill effects such as oöphoritis), is obviated; (*iii*) on the basis of existing evidence there is no reason to fear that super-ovulation will result from oestrogen treatment, though it may easily result from excessive doses of gonadotrophins.

The oestrogen treatment undoubtedly causes a re-activation of the quiescent anterior pituitary, since experiments on laboratory animals indicate that suitable doses of oestrogens stimulate the production of gonadotrophin by the anterior lobe (see Severinghaus, 1939).

We are indebted to the Agricultural Research Council for a grant in support of the experiments referred to in this article and to Messrs. Ciba, Limited, for oestradiol dipropionate (Ovocyclin–P), and Messrs. Schering, Limited, for oestradiol monobenzoate (Progynon–B Oleosum Forte).

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negative result, though it was probably the former, as the biscuit had been left exposed in an open shed to several weeks of frost, and I did not expect a positive result after this freezing of the biscuit. Note the lengthened incubation as the age of the biscuit increases. In every case the quantity was 4 oz. of biscuit twice daily fed dry, except in No. 8, when cow's milk was added. My first assumption when Admin and then milk was added was that it delayed the onset of attacks, but this was negatived by the result with No. 10.

POULTRY INDUSTRY EXPANSION IN CANADA

"The poultry industry is booming in Canada at the present time, thanks to the British demand for Canadian eggs, states *The Scottish Farmer*, and continues: "An order for 5,400,000 dozen eggs to be shipped to the British Ministry of Food in May was followed by a similar order for delivery in the autumn, and during the first six months of the present year the Food Ministry's orders for Canadian eggs reached a total of 510,000 cases, or 15,300,000 dozen eggs. To meet these orders, and also an increasing home demand, Canadian poultry-keepers are building up their stocks of poultry, and demonstrating at the same time that the majority of their flocks have the breeding which ensures heavy production of eggs when good feeding methods are employed. For the expansion of their industry, and for improvements in its efficiency, considerable credit is due to progressive breeding practices put into effect during the past 20 years under the National Poultry Breeding Plan, which co-ordinates the efforts of Government agencies, poultry-breeders, hatchery-men, and others interested in poultry improvement, and whose whole aim is to lower the costs of production and increase the output of higher-quality eggs and poultry meat. As an indication of the progress which has taken place under this policy in the improvement of poultry flocks, it is recorded that in 1919, the first year in which "R.O.P." was in operation, and when a hen, to qualify for certification, had only to produce 150 eggs in a year, and only one of which had to weigh 2 oz., no more than 17 per cent. of the birds entered were able to qualify; but last year, although the standard for certification had been raised to a minimum production of 200 eggs a year, averaging 24 oz. to the dozen, 30 per cent. of the hens managed to qualify. Much greater attention is also being paid to meat type than was the case 20 years ago. With European supplies of eggs unobtainable, and the keeping of poultry in Britain being crushed and discouraged, the Canadians are getting a great opportunity to establish a strong footing in the British market, and they are going to make the most of their opportunity."

Swine Influenza in the British Isles*

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Swine influenza has been extensively studied in America, where it was first described by Dorset *et al.* (1922). The disease affects young pigs (10 to 14 weeks old), is characterised by pneumonia, and coughing and sneezing are the most prominent symptoms. The onset is sudden and recovery is rapid; the mortality is low. Shope (1931) showed that it was caused by a virus combined with *Haemophilus influenzae suis* and that the bacterial infection played an essential part in the aetiology of the natural condition.

An infectious pneumonia of pigs has been recognised for many years in Europe, but its relationship to the American influenza has not been established. In Germany the disease (*Ferkelgrippe*) affects piglets three to four weeks old and, according to Köbe (1933), it is caused by *H. influenzae* and a filtrable virus; chronic cases of the disease are common and *Pasteurella suiseptica* is recovered from a large proportion of the pigs so affected.

Lamont (1938) produced evidence that an influenza-like disease occurs in N. Ireland, and Lamont and Shanks (personal communication 1940) have studied it recently. There are no published reports of its existence in England. An infectious pneumonia is recognised by veterinary practitioners, but the aetiology of the condition has not apparently been studied. We have investigated several outbreaks and in each case have demonstrated the presence of a filtrable virus; in some herds the disease resembled the influenza as described elsewhere.

Some Observations on a Typical Influenza-like Disease of Pigs

(Outbreak T/1)

An outbreak of pneumonia on an Essex farm was investigated. There was no previous history of the disease, and, although there were pigs of all ages on the premises, it affected only those 8 to 14 weeks old. Sneezing was the most characteristic feature and many of the pigs showed no other signs of infection. Severe cases developed symptoms of pneumonia and prostration; delirium was noticed at the height of the attack in a few.

The course of the disease was usually short, but the pigs which had shown evidence of pneumonia were unthrifty for several weeks and suffered from a chronic cough. The mortality was low. *Post-mortem* examination revealed catarrhal changes in the nasal cavity and in most cases the lungs were also involved. The extent of the pulmonary lesions varied though it was mainly the apical, cardiac and intermediate lobes which were affected. Sections of typical lungs revealed a broncho-pneumonia, with areas of collapse. There was also a peribronchitis, and in many instances the bronchioles were surrounded by a zone of small round-celled infiltration.

Haemophilus influenzae was recovered from three of five cases examined and the strains required both X and V factors for growth, especially large amounts of the latter (Fildes, 1923).

Pigs could be readily infected by the intranasal instillation of Berkefeld filtrates of the lungs and turbinates although the condition produced was much milder than that which resulted from the use of unfiltered lung infected with Haemophilus. With the superimposed bacterial infection the clinical picture was not so striking as that of the field disease and sneezing was not a constant feature.

In view of the influenza-like nature of the condition an attempt was made to infect ferrets in the same way. The first experimental animal showed only a slight rise in temperature, but when the material from this ferret was passed to another, acute symptoms resulted and this occurred in ten succeeding ferrets. The temperature reaction was typical of influenza and the symptoms included sneezing, with signs of pneumonia in severe cases. The ferret-adapted virus (Glover's C1—*vide infra*) was infective for pigs. Evidence that the virus with which we had been working was closely related to that causing the natural disease was obtained by the demonstration of neutralising antibodies in pooled samples of blood obtained from convalescent pigs on the affected farm.

Evidence Concerning a Virus Pneumonia of Swine in England

During the winter of 1940 four selected outbreaks of pig pneumonia were investigated. The particulars relating to them can be summarised as follows:—

S/1. This outbreak was described by the veterinary practitioner as being typical of a specific pneumonia of pigs which occurs in Norfolk. Pigs 10 to 14 weeks old were affected, signs of pneumonia were apparent but sneezing and catarrhal symptoms were not observed. The course of the disease was short and the mortality low. The lung lesions were similar to those found previously and there was also pleurisy and pericarditis. *Pasteurella suiseptica* and *Brucella bronchiseptica* were isolated from the lungs and Gram-positive bacilli from the pleura and pericardium. Normal pigs were readily infected by emulsions of lung material and the virus was adapted to the ferret without difficulty.

H/1. The disease appeared when the pigs from various sows were mixed after weaning. Some of the affected pigs died of pneumonia after an illness lasting about five days, but in others the condition became chronic. Some of the pigs showed signs of enteritis, but we were unable to obtain any evidence of swine fever on the premises. *Post-mortem* examination revealed that pneumonic lesions of the kind found in the previous outbreaks were constantly present. In addition, some of the subjects showed an ulcerative colitis, the lesions being similar to those usually associated with Salmonella infection. Cultures of lungs from affected animals failed to reveal a constant infection; *Pasteurella, Br. bronchiseptica* and diplococci were recovered from different specimens. The infective nature was established by intranasal instillation into normal pigs and later ferrets were infected.

G/1. The general features of this outbreak resembled those of H/1 but there was no evidence of intestinal involvement. Moreover, there was a history that some of the piglets were affected before weaning and sneezing had been observed amongst them. The lesions were confined to the lungs. *Haemophilus influenzae* was recovered from both the specimens examined; streptococci and Gram-positive bacilli were also isolated. Normal pigs were infected with an emulsion of lung, but we were unable to transmit the disease to ferrets.

C/1. This outbreak occurred amongst pigs 10 to 14 weeks old which had been recently purchased. The disease caused only a low mortality but many of the affected pigs became unthrifty and were economically unprofitable. Pneumonic symptoms only were observed and *post-mortem* examinations revealed characteristic lung changes with pleurisy and pericarditis in severe cases. The bacterial findings were somewhat similar to outbreak H/1, but in addition *H. influenzae* was recovered

* Contributions to a Discussion at a meeting of the Section of Comparative Medicine of the Royal Society of Medicine, held on April 23rd, 1941. Reprinted from the *Proceedings of the Royal Society of Medicine*, vol. 34, p. 611 (Section of Comparative Medicine, p. 19), by permission of the Honorary Editors.

from one of the six specimens. The disease was readily transmitted to normal pigs, but despite persistent attempts we were unable to set up symptoms in ferrets or to stimulate a suggestive temperature reaction.

The Examination of Slaughterhouse Material

During the winter months an examination was made of the lungs of pigs at a slaughterhouse. Pneumonic lesions resembling those which had been previously studied were found to be common and it was estimated that at least 25 per cent. of the pigs were affected. The lesions were in various stages of development and in many of the specimens resolution was complete, the areas then being sharply defined and somewhat resembling pancreas in colour and consistency. A cultural examination was made of 40 selected lungs and from three *H. influenzae* was recovered. Streptococci of various kinds were the commonest invaders and *P. suiseptica, Salmonella* and Gram-positive bacilli were recovered from other cases. It was only possible to carry out transmission experiments with material from two of the specimens and the disease was readily transmitted to pigs with emulsions of both of these. One of the strains was discarded, but the other, Glover's C2, which was passaged by the use of a filtrate, was adapted to the ferret without difficulty and has been subsequently maintained.

Discussion

Our findings indicate that an infectious pneumonia of pigs occurs in this country, and we have some evidence that the condition is not uncommon. In the first outbreak we investigated the picture was typical of influenza, and although the symptoms in the other herds were not so striking, the fact that four of the recovered viruses set up the characteristic disease in ferrets indicates the necessity of studying their relationship with known influenza strains from both human and animal sources. The recovery of *Haemophilus influenzae* from a proportion of the field cases is a further indication of the influenzal nature of the disease. Moreover, the indefinite nature of the symptoms in pigs experimentally infected with strain T/1 virus seems to indicate that a typical influenzal syndrome may not occur in all field cases.

The disease we encountered resembled in some respects swine influenza as described in America. They both occur in pigs 10 to 14 weeks old but, while chronic unthriftiness was the more serious feature in four of our five outbreaks, American workers emphasise the acute nature of the disease with rapid recovery. *Haemophilus influenzae* was not constantly present in the field cases we examined and this organism did not appear to play a unique rôle in the aetiology of the disease since other bacteria, such as Pasteurella, were isolated from severe clinical cases. Shope has stressed the importance of Haemophilus as a secondary invader, and while we are in agreement with his views our bacteriological findings are more in accordance with those of McBryde and others (1928) who described a somewhat similar bacterial flora in American cases to that observed by us. It is interesting to note that they isolated Gram-positive bacilli from a number of pigs, which they failed to classify. The organisms of this kind which we recovered were usually associated with suppurative foci, and while they appeared to be a heterogeneous group several showed general reactions similar to those described by the above workers. A further point of interest in connection with our bacteriological findings was the recovery of *Br. bronchiseptica*, which is in accordance with earlier American findings.

The lesions we found closely resembled those from cases of swine influenza in N. Ireland, which were kindly sent to us by Lamont, and we were able to set up a mild disease in ferrets with this material, although we did not succeed in maintaining the virus by passage. Indeed, the only essential difference between the general features of the two diseases would appear to be that unweaned pigs are frequently affected in N. Ireland. The disease in Germany, too, occurs in unweaned pigs, and it is often of a chronic nature. For these reasons Waldmann (1933) states that it is a separate entity from that described by Shope in America, though he considers it to be due to a virus and Haemophilus. It has been suggested by Shope and Francis (1936) that the condition in Germany is caused by prevalent human influenza virus strains and Haemophilus and that only suckling pigs are naturally susceptible to this form of the disease. Our disease in point of age susceptibility resembled the American in four out of the five outbreaks, while in its chronic nature it resembled the European. Age-incidence may be related to the conditions under which the pigs are kept and of little importance in comparing the essential nature of the disease. Moreover, it is likely that our five strains of virus are not themselves identical and further classification of these conditions must await a closer study of the viruses concerned.

In the course of our investigation into outbreak T/1 we showed that the virus persisted in the lungs for some considerable time, its presence being demonstrated in a pig which had been ill for eight weeks. This finding is in accordance with the view of Köbe (1934), who maintains that it may be transmitted by mixing healthy pigs with the survivors of an outbreak. Waldmann (1937) is of the opinion that it spreads by droplet infection, and as a measure of control he advocates a system of management in which there is no aerial communication between the breeding pens. While the lungs of our acute cases were not affected with parasites a large number of worms (*Metastrongylus apri*) were present in the chronic condition. We were unable to obtain evidence that parasites played any part in the development of the disease. This would seem to be a matter for further investigation, however, especially in view of the fact that our colleague Dr. Lapage found 24 of a recent series of 52 normal lungs to be affected with *Metastrongylus apri*.

Abstract.—An outbreak of pneumonia affecting pigs (10 to 14 weeks old) was investigated; the mortality rate was low and recovery was slow. *Haemophilus influenzæ* was recovered from half the pigs examined and the presence of a virus was demonstrated by the intranasal instillation of a filtrate of pneumonic lung. The virus was subsequently established in ferrets and neutralising antibodies were demonstrated in the blood of convalescent pigs to the ferret-adapted virus.

Four further outbreaks of pneumonia in pigs revealed the presence of a virus and in two of these the agent was adapted to the ferret. *Haemophilus influenzae* was obtained from only a few of the pigs.

The lungs of pigs at a public slaughterhouse were examined for pneumonia and lesions were found in some cases. *Haemophilus influenzae* was recovered from three of 40 affected lungs and transmission experiments with material from two lungs were made.

The disease was reproduced in pigs and one of the strains was later adapted to the ferret.

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Examination of the Strains of Swine Influenza Virus

Mr. R. E. Glover (National Institute for Medical Research): Andrewes, Laidlaw and Smith (1935) found that in the sera from adults and from children over 10, antibodies to swine influenza were present as regularly as those active against the human viruses. They were unable to determine whether these antibodies were specific or nonspecific since at that time swine influenza had not been recognised in England.

In order to study the antigenic composition of these pig viruses more thoroughly an attempt was made to transmit them to mice. Dr. Andrewes and I established three strains, two from Cambridge and one from Northern Ireland. The examination of these viruses is still in the preliminary stage, and the information which has been obtained can only be regarded as complementary to the data which have already been furnished by the workers at Cambridge and in Northern Ireland.

Mice were inoculated by the intranasal instillation under ether anaesthesia of 0·05 c.c. of a supernatant fluid from centrifuged suspensions of the material under examination. The two first strains (C1 and C2) which were received through the courtesy of Mr. Blakemore, had been isolated in Cambridge and had been adapted to the ferret, C1 having been passed through a series of ten ferrets, and C2 through three ferrets. Six mice were inoculated with a suspension of ferret lung (C1) and were killed four days later, but no pulmonary lesions were detected. A suspension of the lungs of these mice was transferred to six animals, again without visible result. In the third passage, however, one mouse showed complete consolidation of half of one lung, and one had a suspicious lesion: from this point the invasiveness of the strain became more pronounced. The second Cambridge virus (C2) behaved in a similar manner. The impression was gained that these strains were more readily adaptable to the mouse when the inoculum comprised a mixture of ferret turbinate and lung, since lesions were produced in the first passage with C1 and in the second with C2. The changes in affected mice were those of a plum-coloured consolidation with ill-defined margins which, in severe cases, affected practically the whole of the pulmonary tissues. It is interesting that these strains were apparently much less readily adapted to mice than those examined by Shope.

The material from Northern Ireland was sent in the form of consolidated lungs from natural or experimental cases in the pig. So far only one strain has been established. In this instance the inoculum, comprising a suspension of pulmonary tissue from an experimental pig, readily infected ferrets producing a typical diphasic febrile reaction. On the other hand, mice inoculated with the original material were completely refractory in spite of serial passage through five groups of six each. The strain was eventually adapted to the mouse from a mixture of turbinate and lung of the second ferret in the series, although definite lesions did not appear until the third generation. Efforts to establish other strains from Northern Ireland have not been successful. In these instances, however, the material was derived from natural cases which were regarded as typical of piglet influenza, but as it was not possible to confirm the diagnosis by the inoculation of experimental pigs it is not certain that the virus was actually present.

The three viruses mentioned above have been filtered through gradocol membranes with an average pore size of 0·77μ and have invariably proved infective for mice in dilutions ranging from 10^{-3} to 10^{-5}. Elford, Andrewes and Tang (1936) have already shown that the diameter of the Shope swine influenza particle is in the region of 0·18μ, in which respect it resembles the WS virus. The Cambridge C1 strain was subjected to filtration through a series of gradocol membranes of decreasing porosity. Evidence was obtained that it was identical in size with that of the other influenza viruses.

The amount of virus in the lungs of infected mice has been determined on several occasions. In the mice in the early passage series the titre was not high, varying from 10^{-2} to 10^{-3}, but later the infectivity increased considerably, and all three strains now regularly titrate at 10^{-5} and 10^{-6}.

At present it is not possible to give more than a general pattern of the antigenic structure of these pig strains since their relationship to Shope virus on the one hand and to human strains on the other has not been precisely determined. An attempt was made to compare Shope, C1, C2 and Northern Ireland (N.I.) by serum-neutralisation tests in which convalescent ferret sera prepared against each of these viruses were tested in falling dilutions, varying from 1:2 to 1:1,250, against the homologous and each heterogenous strain. With the exception of the N.I. serum, which contained antibodies which were as effective against C2 as against its own virus, these sera invariably showed a higher antibody content against the homologous than against the heterogenous strains. On the whole, the British strains seemed to be more closely related to one another than to Shope, although there was some degree of cross-protection. It was found that several standard ferret sera (human strains, *viz.*, WS, Tal., Gat., and Chr., and human convalescent sera known to be active against Shope, neutralised C1 virus to about the same extent as the Shope strain.

The fairly close relationship of Shope virus and the British strains was not altogether confirmed by vaccination experiments in mice. In the preliminary experiments mice immunised by two doses of living C1 virus were completely protected against a 1:100 dilution of C1, whereas Shope virus, in a dilution of 1:1,000, produced death or widespread lesions. This result was confirmed by a more extensive trial in which three groups of mice were vaccinated with C1, PR8 and Shope, respectively. Immunity tests gave the following results:—

(1) Mice vaccinated with C1 were almost completely immune to the same strain (90 per cent.) but were only slightly protected against PR8 (8 per cent.) or against Shope (27 per cent.).

(2) Mice vaccinated with PR8 were moderately immune to the homologous strain (73 per cent.) and to C1 (82 per cent.) but showed an appreciable susceptibility to Shope (33 per cent.).

(3) Mice vaccinated with Shope were completely refractory to the homologous strain (100 per cent.) but were only partially resistant to PR8 (27 per cent.) and were completely susceptible to C1 (0 per cent.). There was some indication, however, that these results might be attributable to qualitative factors since a fairly severe test dose was given.

Shope (1939) has found that all his North American strains of swine influenza are serologically identical, or almost so; on the other hand, they stand sharply apart from most human strains. Our immunological studies

are incomplete, but at present they seem to indicate that British pig strains form a less compact group than the American strains and serologically are rather different from them. It is by no means certain that they are as clearly separated from the human viruses as are Shope's strains; possibly they will bridge the gap between human and American porcine influenza viruses.

We are grateful to Mr. F. Blakemore and Mr. H. G. Lamont for sending us material.

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Andrewes, C. H., Laidlaw, P. P., and Smith, Wilson. (1935.) *Brit. J. Exp. Path.* **16**. 566.

Elford, W. J., Andrewes, C. H., and Tang, F. F. (1936.) *Ibid.* **17**. 51.

Lamont, H. G. (1938.) *Vet. Rec.* **50**. 1377.

Shope, R. E. (1939.) *J. Exp. Med.* **69**. 847.

In the following discussion Dr. E. L. Taylor (Veterinary Laboratory, Weybridge) said: My own particular interest lies in Shope's worm-transmission theory. Evidence of the possible inoculation of microscopic or ultra-microscopic infection by parasitic worms has been of the clinical-observation type, usually without controls of any kind, and has frequently depended upon nothing more than the coincident observation of the presence of helminth parasites in a diseased host. At one time a French investigator concluded that by biting and boring into the intestinal wall, or by wounding it with hooks and suckers the majority of helminths favour the penetration of microbes. Some of the observations listed by him, however, appear to be far fetched. As an example, one account, offered as evidence, is of a fatal septicaemia traced to the presence of a single individual *Trichuris*, now generally considered to be among the most harmless of helminth parasites.

Evidence from controlled observations is less easy to find. A few years ago, with the collaboration of H. S. Purchase, I made a series of observations to ascertain whether penetrating nematode larvae or adult strongyloid worms might assist the invasion of the animal body by bacteria from the intestine. *Bacillus anthracis* was used in guinea-pigs in one series, and in another *Salmonella suipestifer* was used in rabbits. In spite of having brought about the coincidence of pathogenic bacteria and intestine-injuring parasitic worms we were unable to find evidence of any action whatsoever on the part of the parasitic worms in assisting the bacterial invasion.

As, apart from one or two special examples such as "blackhead" in turkeys and possibly "footrot" in sheep we cannot find any proof of the transmission of *visible* organisms, we should be all the more cautious about accepting the idea of the transmission of *ultra-visible* organisms by parasitic worms.

There is, however, one very good example of the transmission of some as yet undiscovered disease organism by a parasitic worm, namely, the transmission of the so-called "salmon poisoning" of Canidae by the trematode *Troglotrema salmincola*. This very fatal disease is transmitted to dogs, foxes, wolves, etc., by eating fish of the salmon family, infected with the fluke. There appears to be no other way in which the disease is transmitted naturally. Injection of triturated flukes produces the disease and it now seems to be established beyond any doubt that this trematode while present in the intermediate host fish, is carrying the organism responsible for a fatal disease of dogs.

In spite of this precedent, however, in the presence of alternative explanations concerning the prevalence of swine influenza, the indefinite nature of the symptoms sometimes shown, and the possibility of animals already carrying the infection, unknown to the investigators, the lungworm theory cannot be accepted as a complete explanation.

SHEEP BREEDING AND FEEDING

"Sheep are particularly valuable to us in times like these," says the Ministry of Agriculture in a recent announcement, "because they produce meat with such a small demand upon corn and cake supplies. There is no better means for ensuring the productivity of light land and using upland herbage. Even in normal times our flocks look to concentrates for only about one-seventh of their food requirements.

"A new 'Growmore' Leaflet from the Ministry of Agriculture, *Sheep Breeding and Feeding*, condenses a large amount of useful information into a small space. It deals with the use of farm by-products, such as beet tops, tail corn and bean chaff in feeding, catch crops for weaned lambs and winter keep. Feeding in relation to breeding is also discussed, especially in regard to the two critical times of mating and lambing. The leaflet is obtainable on application to the Ministry of Agriculture, Hotel Lindum, St. Annes-on-Sea, Lancashire."

CLINICAL COMMUNICATION

An Unusual Case of Lightning Stroke in a Herd of Dairy Cows

S. GUY ANDERSON and R. R. BUGG

Aylesbury

Some three weeks ago a frantic client called us up at about 7.30 a.m., while a violent thunderstorm was still in progress. He said that three of his cows had failed to come home, that all the rest were staggering about all over the place, and that the morning's milk had dropped from 35 gallons to 11 gallons.

On arrival at the premises, we found that 22 cows had been lying together in the middle of a field. One had died, and three were unable to get up. We had these slaughtered and made a careful *post-mortem* examination. All had slight reddish discoloration and oedema down the back, and one had a few petechial haemorrhages on the base of the heart and on the liver. No other abnormalities were found, but the carcases failed to set and were condemned, as was one other at a later stage.

Of the remaining 18 cows, all but two appeared to be affected to a greater or lesser extent. They were very sensitive to the touch over the back and loins, crouching in a very exaggerated manner. They looked very apathetic, had violent diarrhoea, and a staggering gait. Several held the head and neck in a peculiar position with the ears poorly controlled. The appetite was variable but in the main poor.

In 24 hours another five of the beasts became much worse and were slaughtered. They were weak, lost control of the hind legs and were unable to rise. This process went on until 15 of them had been slaughtered. These animals lost condition very rapidly and showed *post-mortem* lesions similar to the first bunch, and some had definite reddish marks over the ribs.

About the fifth day the skin of the necks became raised and thickened, and by the eighth day these lesions developed into definite burns with varying degrees of sloughing. The remaining five of the affected beasts appear to have made a recovery, and the sloughs are healing slowly.

Messrs. Dixon and Spriggs, of Berkhamsted, were good enough to come and see some of these beasts and confirmed our diagnosis of lightning stroke.

We report this case as being somewhat unusual in certain features. To have 20 beasts out of 22 struck, and yet none of them killed outright, must be well-nigh unique. One wonders if the great amount of water on the grass acted as a conductor and carried the charge from cow to cow.

Weekly Wisdom

The belief that absolute truth can be discovered by verbal arguments produces an intoxicating feeling of power, which is evident in the writings of Abelard and Aquinas.

This intoxication with verbalism has persisted, and is still seen in young students of the classics or Modern Greats who are qualifying for political life and civil administration.—"Science in War." 1940. Penguin Special. S74. (Page 120.)

ABSTRACTS

[SULPHANILAMIDE SOLUTION AS A TOPICAL APPLICATION FOR INFECTED WOUNDS. Appleby, A. (1941.) *Vet. Med.* **36**. 300-304. (17 refs.).]

The author traces the rapid growth in the use of sulphanilamide in solution for infected wounds since the advent of the sulphonamide groups as bactericidal agents. It has been found that the best solvents for sulphanilamide are propylene glycol and triethylene glycol, both of which can be used with safety on tissues. Three solutions have been developed, *viz.* :

(1) 30 gr. sulphanilamide per ounce of propylene glycol.

(2) 60 gr. sulphanilamide per ounce of solvent consisting of 72 per cent. propylene glycol and 28 per cent. triethlyene glycol.

(3) U.S.B. solution containing 40 gr. of sulphanilamide, 40 gr. urea and a small amount of benzyl alcohol per ounce of propylene glycol.

In addition to its bactericidal properties—mainly against *Staph. albus*, *Staph. aureus* and *Str. pyogenes* —sulphanilamide aids healing and promotes rapid granulation of wounds. Propylene glycol has also a bactericidal action, while the addition of urea to the solution has been found useful as a solvent for proteins where pus and detritus tend to hamper resolution. The use of the particular solution, therefore, depends on the type of wound, its location and character. It has been shown that high concentrations of sulphanilamide enhance its bactericidal effect and that it is possible to obtain local concentrations of between 250 to 660 mg. per cent., while the circulating concentration of sulphanilamide in the blood varies between 3 to 6 mg. per cent., a figure which is well below the toxic level of the drug. The author maintains that from one to four days is required to clean up acute infections and to initiate healing of the wounds. The repeated use of sulphanilamide solution is not recommended once the healing process has started since excessive granulation tissue formation is likely to result. Eight cases treated by this method are quoted, the conditions comprising picked-up nail in a horse, open joint in a dog, abscesses, dog bites and a bilateral otorrhoea. All responded well to this treatment. It is stated, in conclusion, that sulphanilamide solution wound therapy is not meant to supersede ordinary methods but is a useful adjunct to them, making for more rapid elimination of sepsis and quicker healing.

C. D.

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[SYNDROME OF TEMPORARY ALVEOLAR PULMONARY EMPHYSEMA (HEAVES) IN THE HORSE FOLLOWING INTRAVENOUS INJECTION OF HISTAMINE. Audberg, W. G., Boyd, W. L., and Code, C. F. (1941.) *J. Amer. vet. med. Ass.* **98**. 285.]

Symptoms following the intravenous injection of histamine in three horses were : uneasiness, profuse lachrymation, salivation and perspiration, defaecation and tenesmus, and dyspnoea with double expiratory effort lasting over one to two hours. These symptoms were compared with those of acute anaphylactic shock, *viz.*, uneasiness, dyspnoea and urination. Comment is made on the resemblance of these two conditions to that of emphysema in the horse, and it is suggested that the dyspnoea in all three cases is due to contraction of the smooth muscle in the bronchioles.

[To the abstractor the resemblance seems remote, especially as it was thought that the dyspnoea in broken wind was due to loss of elasticity of the lungs due to rupture of elastic fibres in the alveoli.]

J. A. L.

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[INOCULATION WITH CRYSTAL VIOLET VACCINE AGAINST FOOT-AND-MOUTH DISEASE. Graub, E., Zschokke, W., and Saxer, E. (1940.) *Schweiz. Arch. Tierheilk.* **82**. 461-466.]

A report of the employment of crystal violet vaccine against outbreaks of foot-and-mouth disease in the cantons of Berne and Zurich during the spring of 1939. It is claimed that this vaccine provided great protection in over 5,000 premises in affected districts. Two separate batches of vaccine were used, one prepared by Gräub in Berne and the other by a commercial firm in Zurich (Veterinaria A.G. Zürich). This commercial vaccine was made from infective blood alone and although this method gave considerable protection it is recommended that the blood should, whenever circumstances allow, be "enriched" by the addition of ground-up epithelium and vesicle lymph from affected cattle.

A total of 12,421 animals, on 1,119 premises, were inoculated with Gräub's batch of vaccine. Outbreaks of the disease occurred in seven premises. Of these outbreaks six were within eight days of inoculation and one after 42 days. (With this vaccine it is usually considered that the animals are not fully protected until 14 days after inoculation.)

On 408 premises, a total of 4,656 animals, inoculation was made with the commercially produced vaccine. Thirteen outbreaks occurred, 12 within nine days and one after 19 days.

A note is also included of vaccination that has been carried out in other cantons using both preparations of the crystal violet vaccine and also formaldehyde vaccine and metacresol vaccine. Detailed information is not available of the results of this campaign, but the following facts are given : in 5,800 premises 55,000 animals were inoculated with crystal violet vaccine and 15,000 with the formaldehyde and metacresol vaccines ; 139 outbreaks occurred within 14 days and 20 outbreaks were reported after this period. These figures include the breakdowns among the animals inoculated with the formaldehyde and metacresol vaccines (number not specified) and so are said to be too high for the crystal violet vaccine.

W. M. H.

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[NATURALLY OCCURRING TUBERCULOSIS IN DOGS AND SOME OTHER SPECIES OF ANIMALS. Pt. II. ANIMALS OTHER THAN DOGS. Lovell, R., and White, E. G. (1941.) *Brit. J. Tuberc.* **35**. 28-40.]

Cats.—Four out of 110 cats showed tuberculosis. The bacilli isolated from two of these were examined and found to be of the bovine type. The primary lesions were generally in the alimentary lymph nodes.

Sheep.—Two cases were studied, both of which were infected with the bovine type.

Goats.—A bovine strain was isolated from an affected lung.

Mink and Silver Foxes.—Of 40 mink examined, 17 were tuberculous and two of 19 silver foxes were affected. Strains from three mink and one fox were

examined and all proved to be bovine. Infection appeared to originate from the ingestion of infected bovine flesh. In these fur-bearing animals the disease appeared to be progressive since military tuberculosis of the lung was a common finding.

Horses.—Generalisation of infection, especially to the lungs and spleen following a primary alimentary infection, is common. Five cases were examined, and, whilst all were found to be due to bovine type bacilli, three strains were of reduced virulence.

The previously published records of the types of tubercle bacilli isolated from the different species are given in tabular form and detailed protocols of the cases studied are appended.

J. S. P.

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[INTESTINAL ATONY IN OLD DOGS. Ferguson, S. E. (1941.) *N. Amer. Vet.* **22.** 361-368.]

Lentin (carbamylcholine) is a more stable modification of acetylcholine, similar to the mecholyl of human therapy (Major and Cline).

In routine cases of constipation in old subjects, Ferguson begins with enemata of tap water followed immediately by a dose of lentin (route not specified) varying from 0·2 to 4·0 c.c.

Obstipation of the hairball type in cats is treated by a preliminary dose of light mineral oil by stomach tube, followed by lentin after a rest period lasting about 15 minutes.

In cases of heavy impaction (bone, etc.), copious enemata of water are first administered; then follows stomach intubation with plenty of mineral oil, then a period of rest up to three hours. A minimum dose of lentin is then given and during the height of the resultant salivation (about 20 minutes) an oil enema is injected with the hindquarters raised. The author states that manual assistance of impacta through the anal sphincters is rarely needed, and bases his assertions on 123 cases so treated.

The action of lentin is inhibited by atropine.

J. P.

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[A NEW AND EFFECTIVE METHOD OF TREATING CANARY-POX. Manwell, R. D., Goldstein, F. (1939.) *Proc. Soc. Exp. Med. Biol.* **41.** 554-555. (4 refs.).]

Treatment of canary pox, a very fatal disease, with mercurochrome has proved highly effective. Of 26 cases which have been treated to date, only three have died. These were advanced when therapy commenced. The drug was used in alcoholic solutions of 1½ to 3 per cent. The solution was applied with a swab or dropper between the cornea and conjunctiva. Two applications each day for one to three weeks are necessary. In many cases spectacular recoveries occur.

D. D. O.

A surplus on the year of £18 was reported at the annual meeting of the Chillingham Wild Cattle Association, Ltd., held in Newcastle recently. The herd now numbers 29. The hard winter had killed 11.

REPORT

[IMPERIAL VETERINARY RESEARCH INSTITUTE, MUKTESWAR AND IZATNAGAR. Report for the year 1939-40. (Minett, F. C.) (High Commissioner for India, Aldwych, W.C.2. Price 2s. 6d.).]

On his appointment as Director of the Institute, Dr. Minett took over charge in September, 1939. The form of the report has been subjected to certain modifications and information of merely parochial interest has been omitted. Details of research work will in future be left for publication in the scientific journal. Nevertheless, the report in its present form is interesting as it describes in sufficient detail the major activities of a highly developed Veterinary Research Institute of international importance. It is divided into three parts, the General Section compiled by the Director, Special Sections compiled by the respective Section Officers, and a series of Appendices.

General Section.—The members of the superior staff, numbering 35, are specified. There were seven vacancies in the establishment. The subordinate staff consisted of 1,128 in the superior grade, 165 in the inferior grade and 823 labourers.

The designations of the Institute sections have been revised and a new research programme outlined which will be subject to annual revision. The expansion of the Izatnagar Branch at the expense of the Mukteswar Branch is suggested owing to the congestion and isolation of the latter place. This involves a considerable building programme at Izatnagar, where it is proposed to establish a Wool Research Laboratory and in due course, a laboratory for problems connected with hides and skins.

The year's expenditure amounted approximately to £42,000 and the income to £34,400. During the year the output of biological products continued to be massive and the routine work very heavy.

The Director has referred to the research work of the special sections detailed below in his general account of the Institute's activities.

Instruction was provided by the usual post-graduate refresher courses and some special admissions. In future there is to be an advanced course in Animal Husbandry and a Special Poultry course.

Special Sections

General Disease Investigation (Shirlaw, J. F.).—The main function of this section is the examination of and reporting on specimens and data received from cases or outbreaks of disease in the field. Goat diseases received special attention and special investigations were carried out in bovine pleuro-pneumonia (suspected), bovine mastitis, bovine lymphadenitis, equine and bovine encephalomyelitis, equine sterility, equine ophthalmia, tuberculosis. Under the heading of Helminthology, some interesting discoveries are recorded.

Pathology and *Bacteriology* (Haddow, J. R.).—Rinderpest virus work was continued. Investigations were carried out in Ranikhet disease, anthrax, contagious abortion and mallein production. Preliminary work was done in co-operation with the medical authorities in regard to a large-scale production of tetanus antitoxin. Physiological studies included a systematic investigation of lathyrism in horses, vitamin A deficiency in cattle and other deficiency experiments and analyses.

Veterinary Zoology (Datta, S. C. A.).—Work in connection with trypanosomiasis, bovine theileriasis and babesiasis was a prominent feature.

A systematic survey of the protozoa of the alimentary tract of animals has been initiated. Entomological studies were continued in regard to the possible transmission of rinderpest by tabanidae and in the anatomy and life history of certain ticks. Warble-fly surveys were carried out; 17,755 blood smears were examined for protozoa.

Animal Nutrition (Sen, K. C.).—A nutritional survey of a typical village was carried out. Preliminary studies in deficiency diseases, carotene metabolism of cows, and other problems were instituted. Technical advice was given on numerous inquiries.

Poultry Research (Macdonald, A. J.).—Work under this heading is developing. It is pointed out that there is considerable scope for the building up of pedigree strains in the country.

Biological Products (Hassan, S. R.).—Production continued on a large scale. In addition to production work, this section is responsible for the dairy and the care of the animal population.

General.—The Engineering Branch is highly important to the welfare of the Institute and the amount of work to be dealt with is increasing.

The medical and sanitary arrangements appear to be very satisfactory and the general health of the staff, both at Mukteswar and Izatnagar, was good.

The effective management of more than 4,000 acres of estate is a responsible undertaking.

G. K. W.

IN PARLIAMENT

The following are among the questions and answers recently recorded in the House of Commons:—

Dairy Stock

Mr. W. Roberts asked the Minister of Agriculture whether any instructions have been issued to the war agricultural executive committees with regard to the culling of herds of tuberculin-tested dairy cattle?

Mr. Hudson: Detailed instructions have been issued to war agricultural executive committees regarding the culling of cattle. It has been made clear that the scheme of culling applies to inferior, diseased and unthrifty animals and that on a number of farms, particularly those carrying pedigree, milk recorded and attested herds, and those free from disease or with high yielding cows, no abnormal culling will be necessary.

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Agricultural Policy

Mr. De la Bere asked the Minister of Agriculture whether, in order to increase the confidence of farmers throughout the country, he will take steps, before the end of 1941, to announce the broad outlines of a long-term policy for agriculture, extending for a period of five years after the cessation of hostilities, especially having regard to the stimulus that such an announcement would give to war-time effort and enterprise, bearing in mind the necessity of a reasonable guarantee as a solution to the many problems?

Mr. Hudson: In the reply I gave to my right hon. Friend the Member for Horsham and Worthing (Earl Winterton) on November 26th, 1940, I stated that the Government recognised the importance of maintaining after the war a healthy and well-balanced agriculture as an essential and permanent feature of national policy, and that the present system of fixed prices and an assured market would be maintained for at least one year after the end of hostilities so as to ensure stability for a length of time sufficient to put into action a permanent post-war policy for home agriculture. The broad lines of such a policy are under consideration, but I can hold out no hope that a further statement will be possible before the end of this year.

Mr. De la Bere: Will my right hon. Friend tackle the root causes of the problems that led to the slump in agriculture prior to the outbreak of the war? Is he not aware that problems not tackled at their roots beget other problems and that our course then becomes encumbered with futile efforts to deal with these other problems?

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Milking Cows

Colonel Carver asked the Minister of Agriculture how many milk-giving cows now exist in this country as compared with the corresponding total at a similar date in 1940?

Sir G. Jeffreys asked the Minister of Agriculture how many cows drawn from dairy herds have been slaughtered since June 1st last?

Mr. Hudson: Statistics of the livestock population and slaughterings of fatstock are not being made public at the present time. I can, however, assure my hon. and gallant Friends that the Government is fully alive to the need for maintaining the numbers of good milking cows; and the present position in this respect is regarded as satisfactory.

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Harvest (Feeding-stuffs)

Sir L. Lyle asked the Minister of Agriculture whether he can make any statement on the results of the harvest, especially in relation to the food supply of the nation and the provision of winter feeding-stuffs for animals?

Mr. Hudson: It is too early to make a definite statement on the results of the harvest, which has been retarded by unfavourable weather, but I expect them to show a striking expansion of production. The efforts of the farming community this season will have the dual effect of adding very materially to our supplies of staple foods, whilst guaranteeing a high degree of self-sufficiency in winter feeding-stuffs for animals.

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Poultry Feeding-stuffs

Mr. De la Bere asked the Parliamentary Secretary to the Ministry of Food whether, in formulating a policy for importation of eggs, as opposed to a policy for the importation of poultry feeding-stuffs, due consideration will be given to the value of manure produced by poultry maintained in this country; and whether, in view of the interest displayed by the Minister of Agriculture in this matter, he will confer with him with a view to securing an increased amount of manure to aid next year's harvest?

Major Lloyd George: The consideration to which my hon. Friend refers has been taken into account in framing all import programmes which cover both food for humans and feeding-stuffs for animals.

COMBATING SWINE FEVER

Suffolk F.U. scheme to combat swine fever was supported by the County Diseases of Animals Committee at Bury St. Edmunds last week (reports *The Farmers' Weekly* of September 12th).

Briefly, the proposals are for a system of compulsory slaughter with insurance and compensation. They also include the recommendation that there should be a small levy on all pigs slaughtered—to provide funds to meet compensation requirements.

A resolution, which was unanimously adopted, recorded approval of the scheme and recommended it to the Ministry of Agriculture with the proviso that the slaughter policy should only be introduced after the existence of the disease had been confirmed. It also expressed concern at the recurring outbreaks of disease and the "devastating effects therefrom" and drew the attention of the Ministry to the need for research.

NOTES AND NEWS

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events

Sept. 20th.—Entries for Miss Aleen Cust Veterinary Research Scholarship (R.C.V.S.).
Sept. 23rd.—Summer Meeting of the Eastern Counties Division, N.V.M.A., at Cambridge, 2 p.m.
Sept. 26th.—Meeting of the Mid-West Division, N.V.M.A., at Bath, 2.30 p.m.
Oct. 2nd.—Annual General Meeting of the Central Veterinary Society at the Conway Hall, W.C.1, 2.15 p.m.
Oct. 3rd.—Meeting of the North of England Division, N.V.M.A., at Newcastle-on-Tyne, 4 p.m.
Oct. 6th.—R.C.V.S. Committee Meetings, Royal Station Hotel, York.
Oct. 7th.—R.C.V.S. Committee Meetings, Royal Station Hotel, York.
Oct. 8th.—R.C.V.S. Council Meetings, Royal Station Hotel, York.

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N.V.M.A. Annual General Meeting

Dr. W. R. Wooldridge Elected President

Under conditions which again dictated the abandonment of Congress it was highly satisfactory to find an approach to a three-figure attendance at the Connaught Rooms, Kingsway, on Friday of last week when the 59th Annual General Meeting of the National Veterinary Association of Great Britain and Ireland was held under the presidency of Mr. H. W. Steele-Bodger, of Tamworth. Despite the "lull in the air" which justified the call to London, circumstances of travel still remain a formidable obstacle, and the representation of distant areas was a gratifying feature of the gathering. Particularly welcome, therefore, was the effort which had been made to render the occasion something of a social landmark in these somewhat difficult days. The holding of a luncheon at which the Association indulged its privilege of entertaining representatives of the many bodies with which, nowadays, it finds itself in happy and progressive alliance, was no small tribute to the energy and popularity of Mr. Steele-Bodger, whose term of office has done so much to enhance the prestige of our profession. Worthy of special record is the fact that the presence of Dr. Thomas Fraser at this function marked the first occasion upon which the Association has had the honour of entertaining the reigning President of the British Medical Association, and we trust it will be regarded as a precedent.

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A full record of all the proceedings will appear in due course in these pages. As regards the Annual General Meeting of the Association, the key-note, reflected in the great volume of work recorded in the annual report and also in the retiring President's inspiring address from the chair, was a revelation that the circumstances which enforced curtailment of activity upon many organisations had been turned to account by the Association as an opportunity for yet more comprehensive service. Through the warmth of their recognition of Mr. Steele-Bodger's labours on behalf of the N.V.M.A. during his two years' vigorous and purposeful leadership, our members showed their deep sense of indebtedness to one who has done much to imbue all with the knowledge that they belong, not to a body rendered moribund by the war, but to an association re-vitalised by a vision of the essential part it is called upon to play in the agricultural economy of the nation.

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The honour and responsibility of presiding over the destinies of the "National" at this time of mingled stress and opportunity were unanimously conferred upon the President-Elect, Dr. Walter Reginald Wooldridge, M.SC., PH.D., M.R.C.V.S., Lecturer in Biochemistry in the University of London, who at the age of 41 becomes, by some years, the youngest President in its long history. We shall take later occasion to recount the distinguished record of the new incumbent in the realms of science and education and in that wide sphere to which the embracive term "veterinary politics" is customarily now applied.

We congratulate Dr. Wooldridge upon the re-association, through him, with the Presidency of the "National," of a family name renowned in veterinary annals. The N.V.M.A., also, is to be congratulated upon finding young shoulders sufficiently strong to cope with the burden of this high office as well as the exacting duties required of the Deputy Chief Executive Officer of the National A.R.P. for Animals Services.

The retiring President, it has of recent years been arranged, becomes "in Nature's course" Senior Vice-President, while in the wisdom born of past experience of the embarrassing effects of unreadiness, the Council wisely looks ahead to the future occupant of the chair in its recommendation for the Junior Vice-presidency, for the holder of this office acquires the additional dignity of President-Elect. There will be widespread satisfaction—in no way restricted to the practitioner element among our membership—that the mantle of leadership is destined to fall upon Mr. R. C. G. Hancock, of Beaconsfield. Sustained effort in many of the Association's activities has, during the past year, included Chairmanship of the Editorial Committee—a strenuous field where anonymity hides much invaluable labour—as well as Presidency of the Society of Veterinary Practitioners. Happily, however, Mr. Hancock has consented to withdraw his light yet further from under the bushel and to accept the opportunity of serving the Association in that wider sphere for which he is universally acknowledged to be eminently fitted.

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It will be recalled that one of the "domestic" features of the memorable Glasgow ("Exhibition") Congress of 1938, when Mr. Steele-Bodger was chosen President-Elect, was the election of Dr. Wooldridge as Honorary Secretary on the retirement of Capt. J. R. Rider. At the same time Mr. H. E. Bywater became Hon. Treasurer when Capt. W. G. Wragg relinquished that office. The acceptance last week by Capt. Wragg of the invitation unanimously extended to him to rejoin the team of officers in the capacity of Hon. Secretary on the elevation of Dr. Wooldridge to the Chair will be a source of gratification to all who are aware of the proven value to that team both of his personal qualities and of his unrivalled experience of veterinary administrative affairs.

Such changes of officer personnel as are recorded above inevitably figured largely in the proceedings of a meeting which, nevertheless, was seen and used primarily as an opportunity for renewing the Association's strength to go forward to the achievement of vitally important tasks in the momentous days ahead. In this light, the numerical progress of the

"National" intimated in the announcement that the membership stood at the record total of 2,322, with all that this implies of faith in the N.V.M.A. as a means of advancement for the profession, was justly acclaimed as a feature full of hopeful significance for the future.

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Active Service Notes

Roll of Honour

Prisoner of War.—We regret to note that in the list of casualties issued by the Army Council on September 12th, the name of Acting Major J. Clabby, M.B.E., of the Royal Army Veterinary Corps, appears as a prisoner of war.

A Worthy Appeal

It is hoped that all members of the profession, and their families, still have ready to hand—or available by a little "rummaging"—the means to respond promptly to the appeal for books for the men of his Pioneer Corps company made elsewhere in these columns by Major Shaw (R.A.V.C., Ret.). The eagerness of the men in our local areas to accept books—and the demand is by no means confined to "light" literature—is an indication of the very real need to be met amongst those who will have to face the seemingly interminable hours of darkness of the Icelandic winter.

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THE PROFESSION AND FIRE-WATCHING DUTIES

The Association has enquired of the Ministry of Home Security whether that section of the Civil Defence Duties (Compulsory Enrolment) Order, 1941, exempting medical practitioners from fire watching is intended to apply equally to registered veterinary practitioners; also whether, if it is not the intention of the Ministry that the Order should be so interpreted, the Association could be given an assurance that practitioners would only be liable for fire-watching duty in the vicinity of their own premises.

Meanwhile, veterinary surgeons will have to register in the ordinary way and then make individual application for exemption if they wish to be exempted.

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PERSONAL

Appointments, University of Liverpool School of Veterinary Science.—The University of Liverpool announces the following probationary appointments in the School of Veterinary Science:—

Lecturer in Animal Husbandry: Mr. J. O. L. King, B.Sc. (Agric.), M.R.C.V.S.

Demonstrator in Farm Animal Medicine and Surgery: Mr. G. H. Arthur, B.V.Sc., M.R.C.V.S.

Birth.—Scott.—At North Oxford Nursing Home on September 9th, to Jessie, wife of Kenneth N. Scott, M.R.C.V.S., of Bicester, Oxon, a son.

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R.C.V.S. OBITUARY

O'Brien, Thomas Francis, Veterinary Officer, Vom, Nigeria. Graduated Dublin, July 24th, 1924. Died July 10th, 1941.

Mr. T. F. O'Brien, M.R.C.V.S.

An Appreciation

In connection with the death of Mr. Thomas Francis O'Brien, which we record with much regret, and who passed away, after an illness of only two days' duration, at Kano, N. Nigeria, whither he was taken by air for hospital treatment from Maidugari, we have received the following appreciation from a colleague in the same West African field.

By the death of T. F. O'Brien, of the Colonial Veterinary Service, Nigeria, there has gone from amongst us a man of fine qualities.

Of excellent physique, immaculate appearance whether in town or in bush, and charming manners, he was the friend of all. In the heart of Africa, in the area around Lake Chad, where he laboured for many a year, he was the special favourite of all men, both white and black, to whom he endeared himself by his patient conscientiousness, frank demeanour and unbounded hospitality.

Expressions of sympathy from all classes and creeds with whom he worked flowed in after his demise, bearing testimony to his outstanding popularity.

The passing of "O'B." has taken from us here a worthy colleague and a personal friend of the diminishing band of pioneer veterinarians of this part of the world.

W. G. B.

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LEGAL NOTES

Meat from Knacker's Yard.—At West Ham Police Court, recently, a Stratford butcher, Alfred J. Chase, was fined £20 for having in his possession, without licence, for the purpose of trade, meat for human consumption derived from livestock slaughtered in Great Britain, not purchased through the Ministry of Food.

An inspector of the local Food Control Committee said that with Mr. Douglas, the Ministry Deputy Meat Agent for the district, he went to defendant's shop and in his refrigerator saw some pieces of cow meat which in all weighed 308 lb. Chase said that the reason he bought this cow meat was because he was told that he could make sausages from pressed veal, but had found it would not answer, and he had bought the meat to go with it. He said he thought that as it was of poor quality it was not controlled.

Mr. Christopher Douglas, the Ministry official, said he saw the meat in question and knew at once that it had not come from the depot, and suggested to defendant that it had come from a knacker's yard, and he admitted that it had come from a knacker's yard in Stratford Road. He added that a knacker's yard at the present time was allowed to kill animals that were not fit for human consumption and in that way cows could be taken to such yards and killed for animal food. He told defendant he would have to report the matter, and he requisitioned the meat. The next day the meat went to the depot, was found to be fit for human consumption and was sold to manufacturers.

In answer to defendant he said the meat was of poor grade, and added that on inspection it would be classed as "manufacturing reject." That meant that it was fit for human consumption, but only for manufacture. Defendant did say that he intended to manufacture it.

Defendant said he was entirely ignorant of this section of the Order concerned.

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WAR DAMAGE INSURANCE

The Board of Trade have decided with the approval of the Treasury that the premium payable under the Business Scheme for the whole year to September 30th, 1942, shall not exceed 30s. per cent. For the period of six months up to March 31st, 1942, the rate of premium will be 15s. per cent., which will be payable at the option of the insured either in one sum or in two instalments at 7s. 6d. per cent. each covering the quarterly periods to December 31st, 1941, and March 31st, 1942. The rate of premium for the subsequent six months will be determined in March next and will not exceed the limit indicated.

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RED CROSS AND ST. JOHN FUND

After two years of war the Red Cross and St. John War organisation has over 1,000 vehicles in this country, including more than 300 operated by joint county committees and convalescent homes and about 350 attached to military commands. More than half of the vehicles are four-stretcher and two-stretcher ambulances. In addition there are several different types of utilicons, also X-ray units, physio-therapy units, canteens, vans, and motor-cycles. It is estimated that, during this period, the vehicles supplied or staffed by the Red Cross and St. John War Organisation in this country and attached to Army Commands have carried 125,243 patients and travelled 1,283,659 miles.

MINISTRY OF AGRICULTURE NEWS SERVICE

Health Follows Sheep

Arable Flocks are coming into their own again.—Liveliness in the sheep trade is a healthy sign. It has not been uncommon for the price of draft ewes from Down flocks to be 50 per cent. higher than last year's. Cross-bred lambs, too, are selling well at the store sales. For arable sheep are scarce, there are not enough to go round our regained arable acres. The extra 1d. per lb. that will be paid for first grade sheep and lambs and second grade lambs for six months from mid-November provides further encouragement to the folded flocks. It means that a lamb estimated to kill at 54 lb. in January will bring in 74s. 3d. Hurdle sheep have been under a cloud for many years now, but it is possible that even before the war their value was under-estimated. For quite apart from their value to the soil they tread and manure, does any other single man on the average farm where an arable flock is kept produce as much as the shepherd in terms of farm income?

Recent research has shown us how to treat and cure liver fluke, but on the farm where the sheep move round the well-drained arable acres, liver fluke is unlikely to occur. Good feeding from arable crops grown on the farm is good insurance against pregnancy toxaemia, and the sheep-sick pastures and parasitic worms that follow the rusting plough are unknown where an arable flock is kept. Against the debit of extra labour and extra trouble with the arable flock must be set, therefore, the credit of healthy soil and healthy stock, as well as high output per acre and the heavier crops that should follow "the golden hoof."

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Next Winter's Milk

An Important Harvest Lies Ahead.—Dairy farmers have done good work during the last twelve months. Although handicapped by the shortage of concentrates and pasturage, they have maintained the milk supply at a level which at one time was thought impossible. Since the grass season began, a surplus to household milk supplies has enabled valuable stocks of home-produced cheese, and condensed and dried milk, to be set aside for the winter, when the supply position is certain to be difficult. It is a compliment to the skill of producers that they are expected to supply enough fresh milk in the bleak months to cater for an extension of the welfare milk schemes.

A national target has thus been set for the third winter of the war. To reach it, every farm must be well stocked with the maximum of home-grown protein fodder. Much has been done already, but milk producers who realise the part they are playing in the Battle of the Atlantic will put every ounce of autumn aftermath into the silo. Next winter's farm prices for milk will be nearly 1s. a gallon higher than the corresponding pool prices of 1938-39. It will be worth while to produce as many gallons as possible, not merely from the price angle, but because the health of the nation demands them.

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Silage

A report (by S. R. Wragg) has just been published by Harper Adams College, Newport, Salop, under the title "Experiences of Silage Making in the West Midlands" that answers doubts in a practical way. It describes, with considerable detail, what actually happened in 1940 on a number of ordinary farms when the farmer set out (usually for the first time) to make silage. It is interesting to note that with one possible exception all the farmers interviewed have planned to make as much silage this year as in 1940, and in many cases more. The report points out that silage production is an easier proposition on medium to large sized farms than on small ones, chiefly on account of labour supply. All this does not rule out, however, making cake substitute silage on even the very small farm. Other things being equal, silage in a container, says the report, is superior to pit or stack silage.

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PHYSIOLOGICAL ACTION OF WELCH TOXINS

Because of the importance which *Cl. welchii* has assumed in veterinary pathology, we believe the following annotation in the *British Medical Journal* (July 26th, 1941) upon the action of the toxins of this group of organisms will be read with interest:—

"Bacterial toxins susceptible of acute pharmacological experiment are uncommon, not only because of the difficulty of obtaining a pure toxin suitable for investigation, but also because of their general prolonged latent period of action. Exceptions to this, however, are the staphylococcus toxin[1] and certain of the anaerobe toxins, notably those of *Vibrion septique* and *B. welchii*. The early work on the physiological action of bacterial toxins was summarised by Trevan[2] in 1931, and although not extensive it revealed analogies and differences between certain snake-venom effects and the actions of *septique* and Welch toxin.[3] Since that date the work on snake venoms has been greatly extended by the Melbourne studies, and more recently certain of the bacterial toxins—namely, the toxin of the Type D Welch organism—have been included within the scope of their investigations.[4 5] The ammonium-sulphate-precipitated toxin contains, according to their results, two non-specific impurities: one a histamine-like substance removable by precipitation with alcohol in the cold, and the other a cardiac depressor substance. With regard to specific effects of the toxin, it may be mentioned that the unneutralised toxin contracts the isolated guinea-pig jejunum. The main clinical effect of the intravenous injection of fatal doses in lambs is to cause convulsions, due to a direct action of the toxin on the central nervous system, probably on the basal ganglia. The ultimate cause of death is either respiratory failure or cardiac failure accompanied by pulmonary oedema. Owing to the presence of the cardiac-depressant impurity the circulatory effect of large doses of the toxin could not be analysed satisfactorily. In rabbits small doses of toxin produced ataxia and loss of muscle tone, again probably central in origin, while larger doses caused a specific circulatory embarrassment. The development of a tolerance to repeated doses was a feature which this toxin showed in common with other active bacterial toxins. The haemorrhages in the heart muscle in lambs and the haemorrhagic pulmonary oedema in lambs, rabbits and cats after intravenous injection are indicative of the severe tissue damage resulting from the toxin. In their further analysis the Melbourne authors found that the liberation of histamine from the perfused cat lung was a specific effect of injection of the toxin, but that snake venom was more active in this direction. The toxin also liberated adenyl compounds from the cat heart and the perfused rabbit liver and an inactivating enzyme similar to what occurs with cobra venom. It is probable that the local production of adenyl compounds in the rabbit heart partly explains the bradycardia in that animal from the action of this toxin. It is unlikely that adenyl compounds liberated from other organs and tissues reach the heart in effective concentrations, as they are so rapidly inactivated by the blood and tissue enzymes. This is the

(1) *J. Path. Bact.* (1930.) **33**. 889.
(2) *System of Bacteriology in Relation to Medicine*, M.R.C. (1931.) **6**. 194.
(3) *Brit. J. exp. Path.* (1929.) **10**. 281.
(4) *Austral. J. exp. Biol. med. Sci.* (1940.) **18**. 225.
(5) Ibid. 253.

multiple type of response to tissue injury which has been found in varying degrees with a number of toxic agents as in anaphylaxis, certain snake venoms, and peptone. The physiological approach has yielded in the hands of the Melbourne workers results valuable not only to the bacteriologist but also to those interested in the general pathology of the reaction of tissues to injury. When the studies of the enzymic activities of the Welch toxins are completed they, too, should form an interesting corollary to the above results. The fact that products of metabolism of the Welch organism and also the snake salivary glands have similar effects raises once again the age-old question of the functions of such substances in relation to both the organism and its environment, but leaves it as far as ever from solution."

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H.M. STATIONERY OFFICE PUBLICATIONS

The undermentioned have been published recently. Copies can be purchased through any bookseller, or directly from H.M. Stationery Office, at Hotel Lindum, St. Anne's, Lytham St. Anne's, Lancs.

	Price net. s. d.	Post free s. d.
Agriculture and Fisheries, Ministry of:		
Leaflets, Advisory, 301. "Swayback" in Lambs	0 1	0 2
Dozen	0 9	0 11
214. Lamb Dysentery	0 1	0 2
Dozen	0 9	0 11
17. Swine Erysipelas	0 1	0 2
Doz.	0 9	0 11
War Office:		
Chemical Warfare, Medical Manual of, 1940. (Reprinted 1941, incorporating Amendment 1.) (57-559-0-41.)	2 6	2 9

CORRESPONDENCE

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

The views expressed in letters addressed to the Editor represent the personal view of the writer only and must not be taken as expressing the opinion or having received the approval of the N.V.M.A.

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APPEALS FOR EXTRA SUPPLEMENTARY PETROL

To the Editor of the Veterinary Record

Sir,—I have read the note in this week's *Record* regarding Petrol Supplies. I think there is one very important omission. In the heading "Appeals for Supplementary Petrol" this should have read "Appeals for Extra Supplementary Petrol."

As it stands I am afraid some veterinary surgeons when they appeal for supplementary petrol in the ordinary way will follow instruction No. 1 and do it by letter instead of on Form R (MS) 1. It is only for extra supplementary when it has to be done by letter.

Yours faithfully,

John Holroyd.

Cornaa,
Wyfordby Avenue,
Blackburn.

September 14th, 1941.

CONTROL AND TREATMENT OF INFERTILITY

To the Editor of the Veterinary Record

Sir,—In reading Mr. Gould's excellent paper on the Control and Treatment of Infertility, and the subsequent discussion, I was surprised to find no mention made of the use of spinal anaesthesia.

Having administered Neilsen's iodine treatment to a considerable number of cases, with and without anaesthesia, I consider a spinal anaesthetic an essential part of a successful technique. Necessity for restraint of any kind is removed, less assistance is required, internal examination is greatly facilitated, defaecation (which can be a great nuisance) is in abeyance and the distressing straining following the injection is eliminated.

The administration of the anaesthetic is simple and speedy and I feel that, especially for those about to adopt this mode of treatment, its use will contribute a great deal to the rapid and easy passage of the catheter. The dosage I employ varies with the size of the cow from 5-10 c.c. of 5 per cent. Procaine solution with 1:10,000 adrenaline. This gives anaesthesia of the tail, vulva, vagina and cervix and allows the cow to remain steady on her feet. I mention the strength of the Procaine as I find that 2 per cent. solution is insufficient for the purpose.

I have also found that sodium bicarbonate as a 1 per cent. solution in sterile water, injected into the vagina at blood temperature, immediately before service has enabled me to get many cows in calf in herds where inflammatory conditions of the vagina are widespread. In these cases the increased acidity of the vaginal secretion prevents conception by killing the spermatozoa and the sodium bicarbonate solution, by creating a temporary neutralisation of this acidity, enables the spermatozoa to enter the uterus. This, of course, will not cure the vaginitis, but will considerably reduce the unprofitable delay in getting the animal in calf.

Yours truly,

John E. M. Spellman.

The Hill,
38, High Street,
Wickham Market,
Suffolk.

September 12th, 1941.

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READING MATTER FOR TROOPS IN ICELAND: AN APPEAL

To the Editor of the Veterinary Record

Sir,—I should be grateful if you could manage to find room in the *Record* for this appeal for books and other reading material for the men of my company in the Pioneer Corps.

The long Icelandic winter with its few hours of daylight is drawing near and if a few members of the profession or their ladies would kindly send us the odd novel for which they have no further use we should indeed be grateful. Any kind of book, no matter its age or appearance, will be welcome.

Yours faithfully,

G. K. Shaw, Major, R.A.V.C. (Ret.).

Pioneer Corps,
Iceland (C) Force.

August 24th, 1941.

Books, etc., should be addressed to:—
Capt. G. K. Shaw,
Pioneer Corps,
Iceland (C) Force.